

**AMENDMENTS**

The following listing of claims replaces all prior versions and listings of claims in this application.

**In the claims**

Claim 1 (original): An isolated polynucleotide comprising: a) a polynucleotide having the sequence as shown in SEQ ID NO:1, or its complement; or b) a fragment of said polynucleotide wherein said fragment is: i) at least 10 nucleotides in length; and ii) does not correspond identically in its entirety to any portion of the sequence shown in SEQ ID NOs:2 or 3 or any other known polynucleotide; or c) a polynucleotide that selectively hybridizes to the sequence of SEQ ID NO:1, or said fragment, relative to a known polynucleotide.

Claim 2 (original): The polynucleotide of claim 1, wherein said polynucleotide that selectively hybridizes to the sequence of SEQ ID NO:1, or said fragment, relative to a known polynucleotide, hybridizes under intermediate stringency conditions.

Claim 3 (original): The polynucleotide of claim 1, wherein said polynucleotide that selectively hybridizes to the sequence of SEQ ID NO:1, or said fragment, relative to a known polynucleotide, hybridizes under high stringency conditions.

Claim 4 (original): The polynucleotide according to claim 1 wherein said polynucleotide comprises the sequence as shown in SEQ ID NO:1, or its complement, or said fragment thereof.

Claim 5 (original): The polynucleotide according to claim 2 wherein said polynucleotide comprises the sequence as shown in SEQ ID NO:1, or its complement, or said fragment thereof.

Claim 6 (original): The polynucleotide according to any of claim 3 wherein said polynucleotide comprises the sequence as shown in SEQ ID NO:1, or its complement, or said fragment thereof.

Claim 7 (original): The polynucleotide of claim 1, wherein said polynucleotide consists essentially of the sequence shown in SEQ ID NO:1, or its complement, or a fragment thereof.

Claim 8 (original): The polynucleotide of claim 2, wherein said polynucleotide consists essentially of the sequence shown in SEQ ID NO:1, or its complement, or a fragment thereof.

Claim 9 (original): The polynucleotide of claim 3, wherein said polynucleotide consists essentially of the sequence shown in SEQ ID NO:1, or its complement, or a fragment thereof.

Claim 10 (original): The polynucleotide of claim 4, wherein said polynucleotide consists essentially of the sequence shown in SEQ ID NO:1, or its complement, or a fragment thereof.

Claim 11 (original): The polynucleotide of claim 5, wherein said polynucleotide consists essentially of the sequence shown in SEQ ID NO:1, or its complement, or a fragment thereof.

Claim 12 (original): The polynucleotide of claim 6, wherein said polynucleotide consists essentially of the sequence shown in SEQ ID NO:1, or its complement, or a fragment thereof.

Claim 13 (original): The polynucleotide of claim 1, wherein said fragment is at least 12 nucleotides in length.

Claim 14 (original): The polynucleotide of claim 2, wherein said fragment is at least 12 nucleotides in length.

Claim 15 (original): The polynucleotide of claim 3, wherein said fragment is at least 12 nucleotides in length.

Claim 16 (original): The polynucleotide of claim 1, wherein said fragment is at least 15 nucleotides in length.

Claim 17 (original): The polynucleotide of claim 2, wherein said fragment is at least 15 nucleotides in length.

Claim 18 (original): The polynucleotide of claim 3, wherein said fragment is at least 15 nucleotides in length.

Claim 19 (original): The polynucleotide of claim 1, wherein said fragment is at least 20 nucleotides in length.

Claim 20 (original): The polynucleotide of claim 2, wherein said fragment is at least 20 nucleotides in length.

Claim 21 (original): The polynucleotide of claim 3, wherein said fragment is at least 20 nucleotides in length.

Claim 22 (original): The polynucleotide of claim 1, wherein said fragment is at least 25 nucleotides in length.

Claim 23 (original): The polynucleotide of claim 2, wherein said fragment is at least 25 nucleotides in length.

Claim 24 (original): The polynucleotide of claim 3, wherein said fragment is at least 25 nucleotides in length.

Claim 25 (original): The polynucleotide of claim 1, wherein said fragment is at least 30 nucleotides in length.

Claim 26 (original): The polynucleotide of claim 2, wherein said fragment is at least 30 nucleotides in length.

Claim 27 (original): The polynucleotide of claim 3, wherein said fragment is at least 30 nucleotides in length.

Claim 28 (original): The polynucleotide of claim 1, wherein said fragment is at least 35 nucleotides in length.

Claim 29 (original): The polynucleotide of claim 2, wherein said fragment is at least 35 nucleotides in length.

Claim 30 (original): The polynucleotide of claim 3, wherein said fragment is at least 35 nucleotides in length.

Claim 31 (original): The polynucleotide of claim 1, wherein said fragment is at least 40 nucleotides in length.

Claim 32 (original): The polynucleotide of claim 2, wherein said fragment is at least 40 nucleotides in length.

Claim 33 (original): The polynucleotide of claim 3, wherein said fragment is at least 40 nucleotides in length.

Claim 34 (original): The polynucleotide of claim 1, wherein said fragment is at least 45 nucleotides in length.

Claim 35 (original): The polynucleotide of claim 2, wherein said fragment is at least 45 nucleotides in length.

Claim 36 (original): The polynucleotide of claim 3, wherein said fragment is at least 45 nucleotides in length.

Claim 37 (original): The polynucleotide of claim 1, wherein said fragment is at least 50 nucleotides in length.

Claim 38 (original): The polynucleotide of claim 2, wherein said fragment is at least 50 nucleotides in length.

Claim 39 (original): The polynucleotide of claim 3, wherein said fragment is at least 50 nucleotides in length.

Claim 40 (original): The polynucleotide according to claim 1, wherein said polynucleotide, or its complement or said fragment further comprises a detectable label.

Claim 41 (original): The polynucleotide according to claim 1, wherein said polynucleotide, or its complement or said fragment is attached to a solid support.

Claim 42 (original): A host cell comprising the isolated polynucleotide of claim 1.

Claim 43 (withdrawn): An isolated polypeptide encoded by the polynucleotide of claim 1.

Claim 44 (original): An isolated polynucleotide comprising a sequence encoding the polypeptide of claim 43.

Claim 45 (original): The isolated polynucleotide of claim 44, wherein said polynucleotide is at least 3000 nucleotides.

Claim 46 (withdrawn): An isolated polynucleotide comprising a sequence contained in SEQ ID NO:1 and a sequence contained in SEQ ID NO:2.

Claim 47 (withdrawn): The polynucleotide of claim 46, further comprising a sequence contained in SEQ ID NO:3.

Claim 48 (withdrawn): An isolated polynucleotide comprising a sequence contained in SEQ ID NO:1 and a sequence contained in SEQ ID NO:3.

Claim 49 (withdrawn): An isolated polynucleotide comprising a sequence encoding nacrein of *Pinctada margaritifera*.

Claim 50 (withdrawn): The isolated polynucleotide of claim 49, wherein said polynucleotide is between 1000 and 6000 nucleotides in length.

Claim 51 (withdrawn): The isolated polynucleotide of claim 50, wherein said polynucleotide is between 1000 and 2000 nucleotides in length.

Claim 52 (withdrawn): The isolated polynucleotide of claim 49, wherein said sequence is contained in SEQ ID NO:1.

Claim 53 (original): A method of determining a condition that permits pearl formation, said method comprising:

- a) cultivating a pearl oyster under a condition of interest; and
- b) detecting expression of *nacre* gene of the oyster by contacting a sample from the oyster with the polynucleotide of claim 1;

whereby detection of said expression indicates that said condition of interest permits pearl formation.

Claim 54 (original): The method of claim 53, wherein said pearl oyster is of the species *Pinctada margaritifera*.

Claim 55 (original): The method of claim 53, wherein said sample from the oyster comprises RNA.

Claim 56 (original): The method of claim 55, wherein said sample is from mantle tissue.

Claim 57 (withdrawn): An isolated antibody or antigen binding fragment thereof, that binds to the polypeptide of claim 43, or fragment thereof.

Claim 58 (withdrawn): An isolated antibody that binds to the polypeptide of claim 43, or fragment thereof, said antibody made by the method comprising:

(a) immunizing a host animal with a composition comprising said polypeptide, or fragment thereof; and

(b) collecting cells from said host expressing antibodies against the polypeptide, or fragment thereof.

Claim 59 (withdrawn): An isolated antibody that binds to the polypeptide of claim 43, or fragment thereof, said antibody made by the method comprising:

(a) providing a cell line producing an antibody, wherein said antibody binds to said polypeptide, or fragment thereof; and

(b) culturing said cell line under conditions wherein said antibodies are produced.

Claim 60 (withdrawn): A method of determining a condition that permits pearl formation, said method comprising:

- a) cultivating a pearl oyster under a condition of interest; and
- b) detecting expression of *nacre* gene of the oyster by contacting a sample from the oyster with the antibody of claim 57;

whereby detection of said expression indicates that said condition of interest permits pearl formation.

Claim 61 (withdrawn): A method of determining a condition that permits pearl formation, said method comprising:

- a) cultivating a pearl oyster under a condition of interest; and
- b) detecting expression of *nacre* gene of the oyster by contacting a sample from the oyster with the antibody of claim 58;

whereby detection of said expression indicates that said condition of interest permits pearl formation.

Claim 62 (withdrawn): A method of determining a condition that permits pearl formation, said method comprising:

- a) cultivating a pearl oyster under a condition of interest; and
- b) detecting expression of *nacre* gene of the oyster by contacting a sample from the oyster with the antibody of claim 59;

whereby detection of said expression indicates that said condition of interest permits pearl formation.

Claim 63 (withdrawn): The method of claim 60, wherein said pearl oyster is of the species *Pinctada margaritifera*.

Claim 64 (withdrawn): The method of claim 60, wherein said sample from the oyster comprises polypeptides.

Claim 65 (withdrawn): The method of claim 64, wherein said sample is from mantle tissue.

Claim 66 (original): A method of detecting a nacrein-expressing oyster, said method comprising:

- (a) contacting a sample from said oyster with the polynucleotide of claim 1; and
- (b) detecting hybridization of said polynucleotide to the sample.

Claim 67 (withdrawn): A method of detecting a nacrein-expressing oyster, said method comprising:

- (a) contacting a sample from said oyster with the antibody of claim 57; and
- (b) detecting binding of said antibody to the sample.

Claim 68 (original): A method of quantifying *nacre* gene expression in a sample, said method comprising:

- (a) contacting said sample with the polynucleotide of claim 1;
- (b) detecting hybridization of said polynucleotide to said sample;
- (c) comparing the amount of the hybridization of step (b) with the amount of hybridization of said polynucleotide to a reference polynucleotide.

Claim 69 (original): The method of claim 68, wherein said sample is obtained from a pearl oyster.

Claim 70 (withdrawn): A method of quantifying nacrein in a sample, said method comprising:

- (a) contacting said sample with the antibody of claim 57;
- (b) detecting binding of said antibody to said sample;
- (c) comparing the amount of the binding of step (b) with the amount of binding of said antibody to a reference polypeptide.

Claim 71 (withdrawn): The method of claim 70, wherein said sample is obtained from a pearl oyster.

Claim 72 (withdrawn): An isolated polypeptide according to claim 43, comprising amino acids 81-194 of SEQ ID NO:4.

Claim 73 (withdrawn): An isolated polypeptide according to claim 43, comprising amino acids 520-609 of SEQ ID NO:4.

Claim 74 (withdrawn): An isolated polypeptide according to claim 43, comprising amino acids 81-194 and 520-609 of SEQ ID NO:4.

Claim 75 (original): An isolated polynucleotide according to claim 44, comprising a sequence encoding amino acids 81-194 of SEQ ID NO:4.

Claim 76 (original): An isolated polynucleotide according to claim 44, comprising a sequence encoding amino acids 520-609 of SEQ ID NO:4.

Claim 77 (original): An isolated polynucleotide according to claim 44, comprising a sequence encoding amino acids 81-194 and 520-609 of SEQ ID NO:4.